

WEATHER STATION BASED ON IOT TECHNOLOGY

FOLLOW UP 03

Sebastián Fernández Martínez
Science Project
Sister Laura de Rivera
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1. CONTEXT

During the months of March and April 2023 the first prototype of the Weather Station project was designed, built and tested, the technical details are the bellow:

1. **Codename:** Esteban1
2. **Design based on:** Embedded Technologies
3. **CPU:** Arduino Uno
4. **Sensor:** DHT11
5. **Display:** 16 x 2 LCD Display (interfaced using I2C)
6. **Case:** designed using Autodesk Fusion3d and printed using a 3D Printer

Please refer to the journals #1 to #6 for more details about the design and build process.

2. PROCEDURE

Since Esteban1 outputs two types of indicators, temperature and humidity, in order to run a test case and compare the results obtained with the official reports from Ministerio de Medio Ambiente y Recursos Naturales de El Salvador, the team decide to take in count the next parameters:

1. **Trial period:** from April 22nd to May 6th
2. **Test site:** Latitude: 13.73080329772121, Longitude: -89.215690536442
(Residencial Santa Margarita, Senda, #58, Mejicanos, San Salvador)
3. **Hours of Operation:** From 16 hours to 21 hours

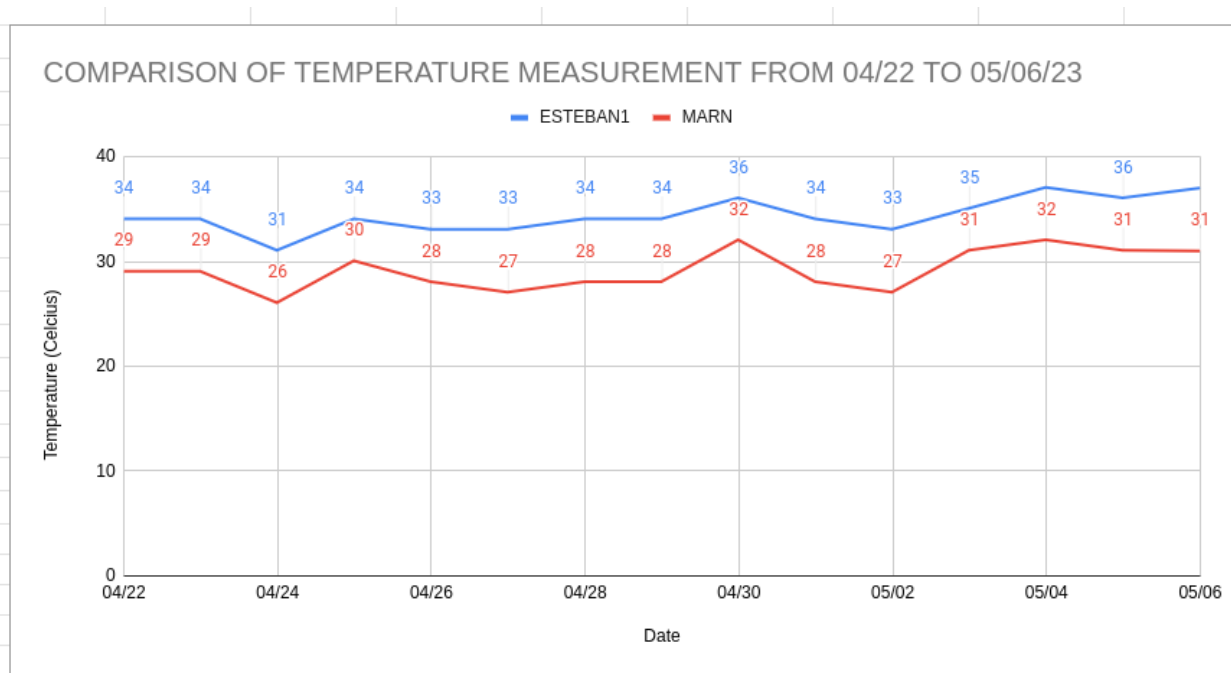
3. RESULTS

A. TEMPERATURE MEASUREMENT FROM APRIL/24 TO MAY/06/2023

TEMPERATURE AND HUMIDITY				
DATE	TEMPERATURE (CELCIUS)		HUMIDITY	
	ESTEBAN1	MARN	ESTEBAN1	MARN
04/22	34°	29°	55%	*
04/23	34°	29°	55%	*
04/24	31°	26°	50%	*
04/25	34°	30°	55%	*

04/26	33°	28°	52%	*
04/27	33°	27°	52%	*
04/28	34°	28°	55%	*
04/29	34°	28°	55%	*
04/30	36°	32°	58%	*
05/01	34°	28°	55%	*
05/02	33°	27°	55%	*
05/03	35°	31°	58%	*
05/04	37°	32°	60%	*
05/05	36°	31°	62%	*
05/06	37°	31°	62%	*

* There is no daily official report where we can find data about humidity

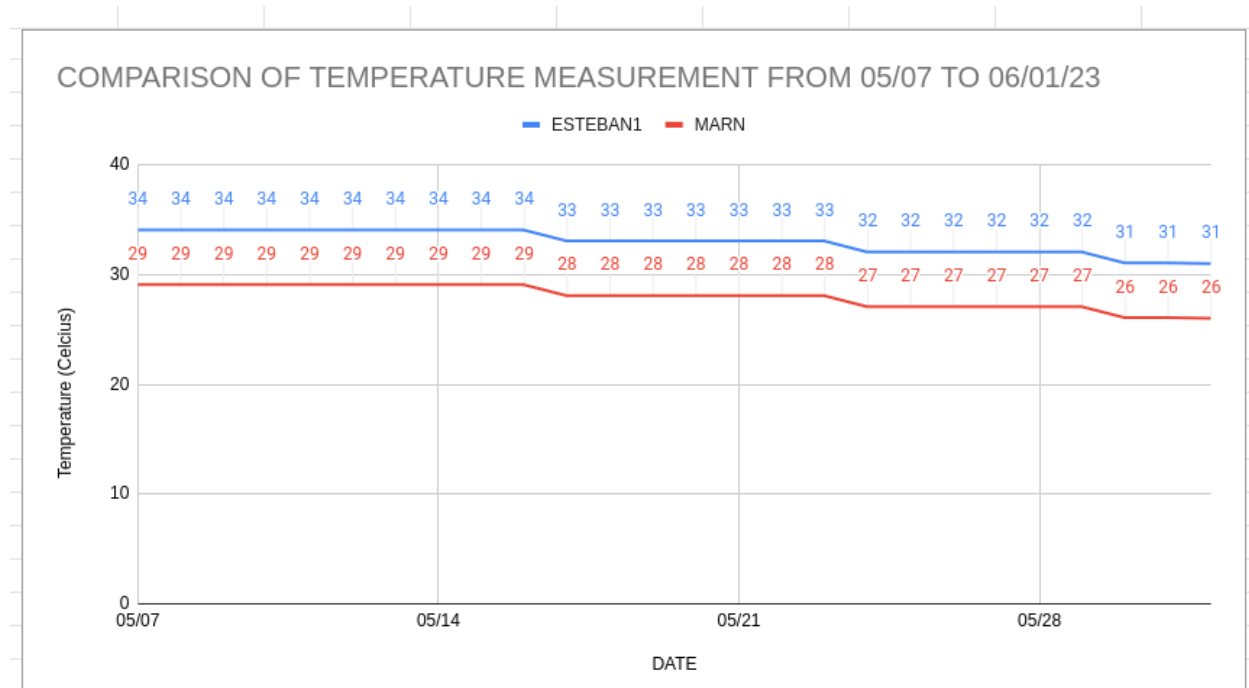


B. TEMPERATURE MEASUREMENT FROM MAY/07 TO JUN/01/2023

TEMPERATURE AND HUMIDITY				
DATE	TEMPERATURE (CELCIUS)		HUMIDITY	
	ESTEBAN1	MARN	ESTEBAN1	MARN
05/07	34	29	55	*
05/08	34	29	55	*
05/09	34	29	55	*
05/10	34	29	55	*
05/11	34	29	55	*
05/12	34	29	55	*
05/13	34	29	55	*
05/14	34	29	55	*
05/15	34	29	55	*
05/16	34	29	55	*
05/17	33	28	55	*
05/18	33	28	55	*
05/19	33	28	55	*
05/20	33	28	55	*
05/21	33	28	55	*
05/22	33	28	55	*
05/23	33	28	55	*
05/24	32	27	52	*
05/25	32	27	52	*
05/26	32	27	52	*
05/27	32	27	52	*
05/28	32	27	52	*

05/29	32	27	52	*
05/30	31	26	52	*
05/31	31	26	52	*
06/01	31	26	52	*

* There is no daily official report where we can find data about humidity



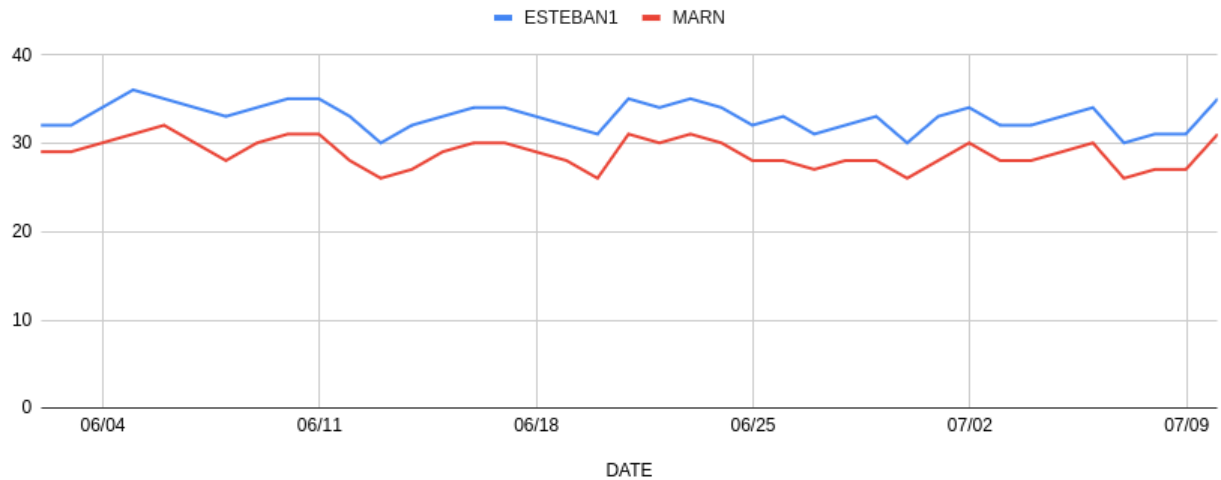
C. TEMPERATURE MEASUREMENT FROM JUN/02 TO JULY/10/2023

TEMPERATURE AND HUMIDITY				
DATE	TEMPERATURE (CELCIUS)		HUMIDITY	
	ESTEBAN1	MARN	ESTEBAN1	MARN
06/02	32	29	58	*
06/03	32	29	57	*
06/04	34	30	60	*
06/05	36	31	60	*
06/06	35	32	60	*
06/07	34	30	59	*
06/08	33	28	59	*
06/09	34	30	59	*
06/10	35	31	59	*
06/11	35	31	59	*
06/12	33	28	58	*
06/13	30	26	58	*
06/14	32	27	60	*
06/15	33	29	60	*
06/16	34	30	57	*
06/17	34	30	62	*
06/18	33	29	61	*
06/19	32	28	60	*
06/20	31	26	60	*
06/21	35	31	64	*
06/22	34	30	62	*
06/23	35	31	64	*

06/24	34	30	61	*
06/25	32	28	58	*
06/26	33	28	58	*
06/27	31	27	57	*
06/28	32	28	58	*
06/29	33	28	58	*
06/30	30	26	55	*
07/01	33	28	58	*
07/02	34	30	59	*
07/03	32	28	58	*
07/04	32	28	58	*
07/05	33	29	59	*
07/06	34	30	59	*
07/07	30	26	55	*
07/08	31	27	57	*
07/09	31	27	57	*
07/10	35	31	60	*

* There is no daily official report where we can find data about humidity

COMPARISON OF TEMPERATURE MEASUREMENT FROM 06/02 TO 07/10/23



4. SOCIAL IMPACT

Climate change is a matter of concern for mankind, specially in the last 5 years the global temperature has increased almost 1.3 degree according to the United Nations, this situation impacts directly on the health, food safety, cost of living among other facts.

For the above reasons, this project intends to put in the map of people the importance of the temperature, based in the results the temperature of an indoor build (house, classroom, etc) without no air conditioned is almost 5 degrees greater outdoors so it is a must to have a device that help us to monitor the current temperature and humidity; there is a high possibility in the future that mankind needs special devices to improve air quality, moreover, in agriculture the temperature and humidity of a spot where the crops are is the key to guarantee the life of the crops; as a matter of fact, this last fact would be the based for a future project where the prototype 1, **esteban1**, may be part of.

5. CONCLUSIONS

- There is no daily official report where we can find data about humidity
- The temperature obtained using Esteban1 is higher than the value reported from MARN because the measurement is indoor.
- The value of the temperature reported from MARN is related to an entire state, with the use of Esteban1 we can obtain a most exact value of a place in particular.
- It would be highly useful to expand the weather report including values of humidity, atmospheric pressure, air quality among other facts.
- The year of 2023 will be one of the hottest in humankind history.
- As a society we need to be conscious of climate change and the way we use natural resources.
- The temperature indoors is higher due to construction material, so it is time to use environmentally friendly materials in order to manage the heat from outdoors.
- The health is directly impacted with higher temperatures: allergies, rash, high blood pressure illness are a few examples.

6. BIBLIOGRAPHY

- <https://www.snet.gob.sv/ver/meteorologia/pronostico/24+horas>